

WHAT IS CLAIMED IS:

1. A solid electrolyte cell comprising:

a positive electrode having a positive electrode current collector and a positive electrode active material;

a negative electrode having a negative electrode current collector and a negative electrode active material; and

a solid electrolyte comprised of an electrolyte salt dispersed in a matrix polymer, said solid electrolyte being arranged between said positive electrode and the negative electrode; wherein

a diene compound is contained in at least one of the positive electrode, negative electrode and the solid electrolyte.

2. The solid electrolyte cell according to claim 1 wherein said diene compound is 1, 4-cyclohexadiene.

3. The solid electrolyte cell according to claim 1 wherein said diene compound is contained in said solid electrolyte.

4. The solid electrolyte cell according to claim 3 wherein said diene compound is contained in an amount of 0.0001 mol to 0.0005 mol to 1g of said positive electrode active material.

5. The solid electrolyte cell according to claim 4 wherein said solid electrolyte is made

up of at least two layers, namely a first solid electrolyte layer formed on the side positive electrode and a second solid electrolyte layer formed on the side negative electrode; and

wherein the amount of said diene compound contained in said first solid electrolyte layer being not less than 75% of the total content thereof.

6. The solid electrolyte cell according to claim 1 wherein said solid electrolyte contains a non-aqueous solvent and is in a gelled state.

7. The solid electrolyte cell according to claim 1 wherein said matrix polymer is selected from the group consisting of polyethylene oxide, polypropylene oxide, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene chloride, polymethacrylic acid, polyacrylic amide, polycarbonate, polysulfone and polyethersulfone.

8. The solid electrolyte cell according to claim 1 wherein said electrolyte salt is selected from the group consisting of  $\text{LiPF}_6$ ,  $\text{LiClO}_4$ ,  $\text{LiCF}_3\text{SO}_3$ ,  $\text{LiCF}_3\text{SO}_3$ ,  $\text{LiAsF}_6$ ,  $\text{LiBF}_4$ ,  $\text{LiN}(\text{CF}_3\text{SO}_3)_2$ ,  $\text{C}_4\text{F}_9\text{SO}_3\text{Li}$ ,  $\text{LiC}(\text{CF}_3\text{SO}_2)_3$ ,  $\text{LiF}$ , and  $\text{LiBr}$ .

9. The solid electrolyte cell according to claim 6 wherein said non-aqueous solvent is selected from the group consisting of ethylene carbonate, propylene carbonate,  $\alpha$ -butyrolactone, acetonitrile, diethylether, diethylene carbonate, dimethyl carbonate, 1, 2-dimethoxyethane, dimethyl sulfoxide, 1, 3-dioxolan, methyl sulfonate, 2-methyltetrahydrofuran, tetrahydrofuran, sulforan, 2, 4-difluoroanisole and vinylene carbonate.

10. The solid electrolyte cell according to claim 1 wherein said positive and negative electrodes are layered and coiled together with interposition of said electrolyte.

11. The solid electrolyte cell according to claim 1 wherein said positive and negative electrodes are layered and stacked together with interposition of said electrolyte.

12. The solid electrolyte cell according to claim 1 wherein a separator is arranged between said positive and negative electrodes.

$$\begin{array}{ccccccc} \text{upper } q_{10} & \text{ab} & q_{10} & q_{10} & q_{10} & \text{III} & \text{upper } q_{10} \\ \parallel & \parallel & \parallel & \parallel & \parallel & \parallel & \parallel \\ \parallel & \parallel & \parallel & \parallel & \parallel & \parallel & \parallel \end{array}$$